

B


--14. A method for cleaning surface or waste water in which the water is supplied to a sludge separator, biopond or the like for separating of suspendable material, characterised in that the water thereafter is supplied to one or several biostep filters in which the water is made to pass a permeable material of a type at which a permeable bioskin may be made to grow to create a micro process without lowering the permeability, whereby a deposition of pollution will take place at the filter or filters, whereafter the water is forwarded to the upper or lower portion of a sorbent chamber in which the water is made to flow through a sorbent material in which an ion exchanger process occurs and thereafter is run off to a recipient, the biostep filter used being comprised of a sintered material for the best permeability to prevent organic material of BOD to grow on the material of the sorbent filter.

15. The method according to claim 14, characterised in that the sintered material is pure polyethene.

16. The method according to claim 14, characterised in that as sorbent material a natural material with high phosphorus and

heavy metal binding capacity, for example calcium silicate, is used.

17. The method according to claim 14 characterised in that the sorbent material is stirred.

18. The method according to claim 14 characterised in that the water to be cleaned is sprinkled over the sorbent material.

19. The method according to claim 14 characterised in that the sorbent material may be used as soil improvement agent.

20. Means for carrying out the method according to claim 14 for cleaning surface of waste water comprising a sludge separator (14) for coarse separating of suspendable material, characterised in that one or several biostep filter (18, 36) for degradation of biological material is provided after the sludge separator (14, 114), which bio filter comprises one or several filter of a permeable material and a sorbent filter (28, 40) for reduction of e.g. phosphorus and/or heavy metals by means of an ion exchanger process provided after the biofilter (18, 36) and a pump station

(22, 38) for keeping the flow of water through the plant and supplying it to the sorbent material provided in the plant.

21. The means according to claim 20, characterised in that the biostep filter comprises pipe shaped bodies (42,48) of a permeable material arranged so that the water flows from the outside of the body to its inside while depositing pollution at the external mantle surface of the pipe shaped body (42,48), where a biological micro-process is created and proceeds without influences on the permeability of the material.

22. The means according to claim 21, characterised in that the sorbent filter comprises manifold means (30, 44) for distribution of the water over the sorbent material, which is provided at a perforated bottom in the sorbent filter.

23. The means according to claim 20 characterised in that the sorbent filter comprises an agitator (98) for stirring of the sorbent material.

24. The means according to claim 19, characterised in that

the pipe-shaped bodies (42, 48) is inserted in a plate (52) and has an opening from the inner of the body which opens up above the plate (52), which is sealingly mounted in a filter chamber (36, 46) in which the water flows into (at 16, 116) the chamber underneath the plate (52) and through the bodies (48) to the upper of the plate (52) and from there further to an outlet (20) from the chamber (46).

25. The means according to claim 22, characterised in that the plate (52) has struts (58) directed downwards, dimensioned so that they force the plate, against the hydrostatic pressure of the water, against a support bracket (56) provided at the inner periphery of the filter chamber (46) while a seal (54) supports inbetween.

26. The means according to claim 20 characterised in that the biostep filter (36), the sorbent filter (40) and the pump station (38) are built together in a compact house (34), divided into three corresponding chambers.

27. The means according to claim 20 characterised in that

the sorbent filter comprises a chamber (72) in which a number of receptacles (74) with sorbent material are inserted, the water from the previous biostep filter is fed to the receptacles at their upper portion or bottom.

B1  
cont.

28. Using of a permeable material at which a bioskin is created, where a biological microprocess proceeds, as material in a biostep filter according to claim 18.--

---

Respectfully submitted,

DOWELL & DOWELL, P.C.

By 

Ralph A. Dowell, Reg. No. 26,868

Date: January 4, 2002

DOWELL & DOWELL, P.C.

Suite 309, 1215 Jefferson Davis Highway

Arlington, VA 22202

Telephone - 703 415-2555

Facsimile - 703 415-2559

E-mail - [dowell@dowellpc.com](mailto:dowell@dowellpc.com)